ON THE ASCARIDS OF THE DOG AND CAT

BY

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On looking through the collection of the *Ascarids* of the dog and cat at the Liverpool School of Tropical Medicine, four of the several specimen jars of worms from the cat were found to contain a species of *Toxascaris ;* of these, two contained *Toxascaris* sp. together with *Belascaris mystax*, while the remaining two contained *Toxascaris* sp. only. As no species of the genus *Toxascaris* seems to have been previously recorded* in the cat, the specimens were examined more closely and were found to present the following specific characters : Length of male 19 to 65 mm., length of female 22 to 80 mm. Cuticle finely striated, the striations being a distance of 4 to 9μ apart. The labial pulp shows two anterior lobules, detached from the main pulp by a well-marked cleft, and presenting a shallow depression at their extremities. The cervical alae are long and narrow, gradually decreasing in width posteriorly.

The caudal extremity of the female terminates in an acute point, and the vulva is situated about the junction of the anterior and middle thirds of the body. The eggs are 70 to 80μ in diameter, globular or subglobular and have a thick, smooth shell. The caudal extremity of the male presents a number of papillae of which there are six post anal on either side, two sub-dorsal, one lateral, small and difficult to see, and two sub-ventral, while just behind the anus on either side is a large double papilla ; these last three may be regarded as a continuation of the row of preanal papillae. Anterior to the anus on either side is a row of twenty-five or more preanal

* Since writing this paper my attention has been drawn to the fact that Baylis (1924), has recently recorded the presence of *Toxascaris leonina* in the cat.

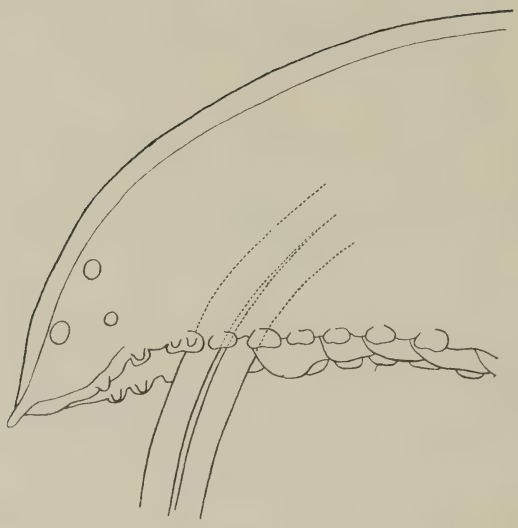

FIG. 1A. *Toxascaris*, sp. Cat. Caudal extremity, lateral view.

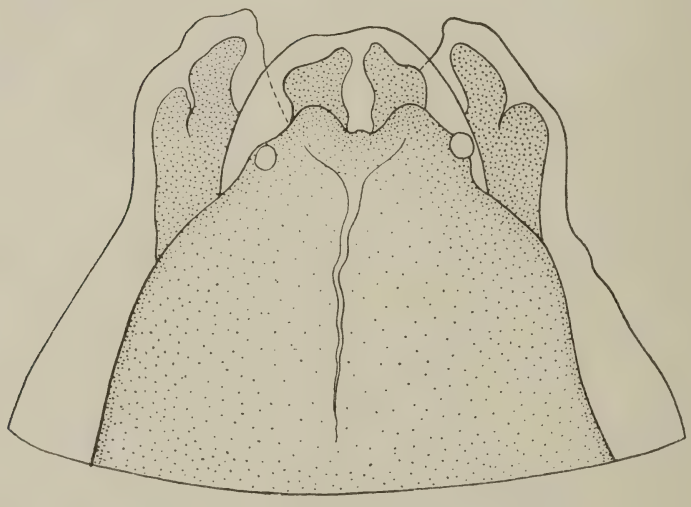

FIG. 1B. *Toxascaris limbata.* Head, dorsal view.

papillae, sub-ventrally placed; these increase in size posteriorly and towards the anus are large and can be much more readily distinguished than in the male *Belascaris mystax*.

The spicules of the male are 0·7 to 1·26 mm. in length and slightly unequal; they are not winged and are extended in about 25 per cent. of preserved specimens.

The lengths and other details of the worms belonging to the genus *Toxascaris*, collected from the four cats, are given in Table I.

Toxascaris limbata from the dog was now examined with a view to comparison, and measurements were made of the worms collected from four dogs. No difference in general morphology and microscopic appearance could be found. Details of measurements of these worms are given in Table II and it will be noticed in comparing these two tables that while the individuals vary greatly in size, there is no general difference between those from the two hosts.

Specimens of *Toxascaris leonina* from the lion were now examined, and, as with *Toxascaris limbata*, were found to differ in no particular from the species found in the cat. Details of measurements are given in Table III.

Railliet and Henry (1911) describe three species of *Toxascaris*, viz., *T. leonina*, *T. limbata* and *T. microptera*. Of the last species only two poor specimens were available and the description given is therefore very incomplete. *T. limbata* and *T. leonina* are described more fully and both descriptions seem to tally very well with the species of *Toxascaris* from the cat. Measurements of the two species made by Railliet and Henry are given in Table IV, and it will be seen that differences in size are very slight. The only other distinguishing features mentioned by these two observers are, firstly, that the caudal extremity of the female *T. limbata* terminates in a more acute point; and secondly, that the spicules in the male *T. leonina* are more frequently extended. These two relative characters seem to be of little value in distinguishing the two species. The comparative sharpness of the caudal extremity in *T. limbata* I have not been able to see, while the relative frequency with which the preserved male worm is found to have the spicules retained within the body or protruding from it seems to be a variable factor, since observations on a large number of specimens of *Belascaris mystax* and *Belascaris marginata* at my disposal, have shown the

spicules to be more frequently retained in the former than in the latter species, whereas Railliet and Henry found the reverse.

In my opinion, there is insufficient reason to warrant the division of the genus *Toxascaris* into the three species mentioned, and the

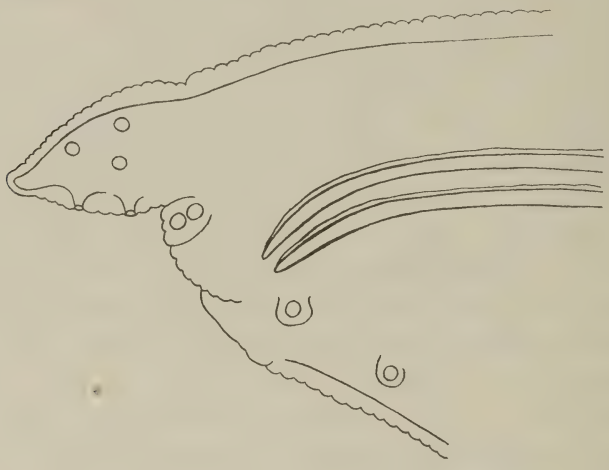

FIG. 2A. *Belascaris mystax.* Caudal extremity, lateral view.

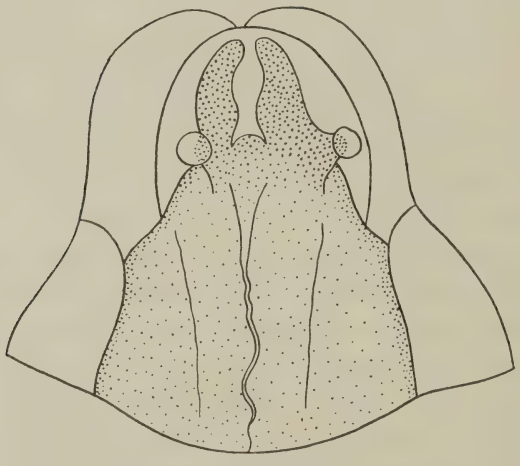

FIG. 2B. *Belascaris mystax.* Head, dorsal view.

Toxascarids of the lion, the dog and the cat are probably identical, and should be known as *Toxascaris leonina* (Linstow, 1902). To the three hosts mentioned, may be added the various hosts of

T. leonina given by Baylis and Daubney (1922), the tiger, leopard, ounce or snow leopard, fishing cat, leopard cat, hunting leopard and Indian fox.

Worms of the genus *Belascaris* from the dog and cat were found to fall into two distinct and definite species, viz., *Belascaris mystax*, confined to the cat, and *Belascaris marginata* confined to the dog. The most striking difference between these two species is seen in the spicules, which are relatively much larger in *B. mystax*, being about one twenty-fifth of the body length, while in *B. marginata* they are only one seventy-fifth of the body length. The difference between the cervical alae is also well marked; in *B. mystax* they are broad, having their widest part near their posterior extremities, where they terminate abruptly; while in *B. marginata* they are long and narrow and terminate gradually, resembling those of *Toxascaris leonina*. Particulars of measurements from numbers of these worms are given in Tables V and VI.

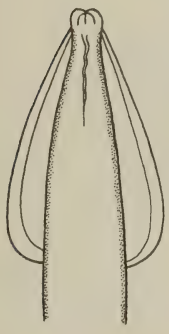

FIG. 3A.
Cervical aleae.—*Belascaris mystax.*

FIG. 3B.
Cervical aleae.—*Toxascaris limbata.*

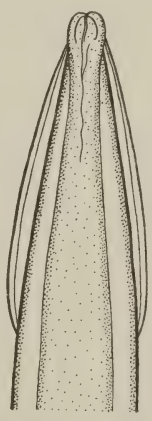

FIG. 3C.
Cervical aleae.—*Belascaris marginata.*

I have not been able to satisfy myself as to the presence of the caudal alae mentioned by Railliet and Henry (1911) as very distinct in *B. mystax*. Several specimens when rolled under the microscope presented a dark longitudinal line on either side resembling the edge of a wing, turned upwards; but on examining the same caudal extremities in section, the effect was seen to have been produced by the dark, somewhat opaque walls of the much flattened gut, which, seen on edge, through the cleared cuticle of the specimen might be mistaken for caudal alae.

TABLE I

Showing measurements of *Toxascaris* sp. from the cat.

Specimen bottle	Length of male in mms.	Length of female in mms.	Length of spicules in mms.	Distance between striations in μ	Size of eggs in μ
No. I	65	80	1·26	9	...
No. II... ...	40-50	47-75	0·80-0·95	7	60 × 81
No. III ...	19-25	22-23	0·70-0·87	4-5	...
No. IV ...	32	30	0·89	7-8	...

TABLE II

Showing measurements of *Toxascaris limbata* from the dog.

Specimen bottle	Length of male in mms.	Length of female in mms.	Length of spicules in mms.	Distance between striations in μ	Size of eggs in μ
No. I	30-35	40-60	0·95-1·04	5	60 × 75
No. II... ...	30-48	65-80	0·89-1·04	8·5	...
No. III ...	40-45	(18)40-60*	Old specimens could not be clearly seen	7·5	...
No. IV ...	55-70	75-100	1·11-1·27	7·4-14·6	74 × 86

*This is the measurement of one very small worm among a number of larger ones.

TABLE III

Showing measurements of *Toxascaris leonina* from the lion.

Specimen bottle	Length of male in mms.	Length of female in mms.	Length of spicules in mms.	Distance between striations in μ	Size of eggs in μ
No. I	37	50-68	1·12	8-9	60 × 85
No. II ...	28-52	29-63	1·00-1·50	4-10	66 × 75 to 70 × 84
No. III ...	37-43	39-70	1·05-1·20	4-11	66 × 75 to 68 × 84

TABLE IV

Showing the variation of length and other detailed measurements in the *Toxascaris* spp. from the cat, dog and lion, together with the measurements of *T. leonina* and *T. limbata* given by Railliet and Henry.

	Length of male in mms.	Length of female in mms.	Length of spicules in mms.	Distance between striations in μ	Size of eggs in μ
Toxascaris sp. from the cat	19-65	22-80	0·7-1·26	4-9	60 × 81
Toxascaris limbata from the dog	30-70	40-100	0·89-1·27	5-14·6	60-74 to 75-86
Toxascaris leonina from the lion	28-52	29-70	1·00-1·50	4-11	66 × 75 to 70 × 84
Toxascaris leonina [Railliet and Henry] ...	20-50	30-80	0·9-1·25	5-8	70-80
Toxascaris limbata [Railliet and Henry] ...	40-60	65-100	1·2-1·5	6-12	75-85

TABLE V

Showing measurements of *Belascaris marginata* from the dog.

Specimen bottle	Length of male in mms.	Length of female in mms.	Distance between striations in μ	Length of spicules in mms.
No. I	70-90	90-165	13-37	0·95 (extended)
No. II	70	67-170	12-24	1·05 (retained)
No. III	70	120-130	18-24	1·01 (extended)
No. IV	55	80-90	13·6-24	1·04 (extended)
No. V	50-75	50-120	9-27	0·74-1·3 (varying positions)

TABLE VI

Showing measurements of *Belascaris mystax* from the cat.

Specimen bottle	Length of male in mms.	Length of female in mms.	Distance between striations in μ	Length of spicules in mms.
No. I	60	85-108	24-37	1·98 (retained)
No. II	27-40	42-70	14·5-25	1·85-2·08 (varying positions)
No. III	53	80	18·5-28	2·08 (retained)
No. IV	...	63-85	18·5-29	...
No. V	42-70	90-105	10-27	1·63 (retained)

Table VII

Showing the variations in length and other details in *Belascaris marginata* and *Belascaris mystax*, together with those given by Railliet and Henry.

	Length of male in mms.	Length of female in mms.	Distance between striations in μ	Length of spicules in mms.
Belascaris marginata from the dog ...	50-90	50-170	9-37	0·74-1·05 (usually extended)
Belascaris mystax from the cat ...	27-70	42-108	10-37	1·63-2·08 (usually retained)
Belascaris marginata (Railliet & Henry) ...	50-100	90-180	16-22	0·75-0·95 (rarely extended)
Belascaris mystax (Railliet & Henry) ...	30-60	40-100	12-16	1·7-1·9 (generally extended)

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